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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BENJAMIN CHALONER-GILL,
ALLISON A. PINOLI,
CRAIG R. HORNE,
RONALD J. MOSSO, and
XIANGXIN BI

Appeal 2008-004615
Application 09/845,985
Technology Center 1700

Decided:¹ July 14, 2009

Before CHARLES F. WARREN, CATHERINE Q. TIMM, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON REQUEST FOR REHEARING

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

This is in response to a Request, filed February 19, 2009, for rehearing of our Decision, decided December 19, 2008, wherein we sustained the § 103 rejections that rely upon the disclosures of Kamauchi in view of Manev as evidence of obviousness.

Appellants argue that the Board legally erred in determining that the combined teachings of Kamauchi and Manev would have put Appellants' claimed invention in the hands of the public (Request 5-6). Appellants contend that Kamauchi fails to teach the particle uniformity and Manev fails to teach how to produce particles with an average particle size below one micron and having a uniform particle size, such that the combination does not teach how to make a relevant powder with an average particle size below a micron and a high particle uniformity (Request 6). Appellants contend that Kamauchi and Manev do not enable the manufacture of particles falling within the disputed claims because they do not teach the claimed composition or a method of making it (Request 5-6).

Appellants' arguments are unpersuasive because they improperly focus on the teachings of Kamauchi and Manev individually, rather than focusing on what their teachings, as a whole, would have suggested to one of ordinary skill in the art. As stated on page 15 of the Decision, the teachings of Kamauchi and Manev would have suggested the claimed composition having an average particle size less than about 1 micron and the claimed particle size distribution. Specifically, Kamauchi teaches an electrode material containing lithium and phosphorus particles having an average

particle size of 10 nanometers (Decision 15). Manev discloses that it is generally known in the electrode arts that average particle size and particle size distribution are two of the properties characterizing positive electrode materials and that it is desirable to decrease the particle size and particle size distribution (Decision 15). Based on these disclosures, Kamauchi and Manev would have suggested forming a lithium and phosphorous containing material with a submicron average particle size and a particle size distribution as claimed by Appellants.

Plainly, the disclosures of the references as a whole would have enabled one of ordinary skill in the art to make a composition containing lithium and phosphorous with a submicron average particle size and the claimed particle size distribution. Manev's disclosure that decreasing the mean particle size and particle size distribution typically increases battery cyclability (Decision 15) indicates that one of ordinary skill in the art knew how to produce powders with decreased mean particle sizes and particle size distributions, which were then tested for cyclability. Kamauchi's disclosure that a composition containing lithium and phosphorous may be produced with a 10 nm average particle size evinces the capability of forming a composition with the claimed average particle size. Accordingly, one of ordinary skill in the art presented with these teachings would have been enabled to make a composition with a submicron average particle size and a particle size distribution as claimed.

Regarding whether Kamauchi and Manev enable the production of a claimed composition having a less than 1000 nm particle size and the particularly claimed particle size distribution, Appellants contend that “[t]he art is certainly not at a high level of predictability since nanotechnology is not that highly developed” (Request 6). Appellants further argue that “[a] moderate level of unpredictability in view of the differences in the compositions of matter easily overcomes any arguments based on the touching of the average particle sizes” (Request 6). However, this apparent reference to the “predictability of the art” factor of *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988), is raised for the first time on appeal in this Request. In accordance with 37 C.F.R. § 41.52, because such a new argument is not made regarding a “recent relevant decision of the Board or a Federal Court” or in response to a new grounds of rejection under § 41.50(b), Appellants’ newly advanced argument has not been considered.

Appellants argue that claims 2 and 3 (i.e., Group 2 claims) have a maximum cut-off in particle size of 250 nm such that the upper limit in average particle size is even more clearly distinct from Manev’s particle size (Request 7). Specifically, Appellants contend that Manev’s particle sizes are four times larger than the claimed average particle size of claim 2 such that the combined teachings of Kamauchi and Manev do not place the subject matter of claim 2 in the hands of the public (Request 7).

Contrary to Appellants’ arguments, we adhere to our determination on page 17 of the Decision that Kamauchi’s disclosed average particle size of 10 nm satisfies Appellants’ claim to an

average particle size of from 5 nm to 250 nm as recited in claim 2.

Appellants' arguments fail to address the fact that Kamauchi discloses the average particle size.

Appellants argue that the average particle size and particle size distribution are interrelated properties, which the Board failed to consider together (Request 7). However, as indicated on page 15 of the Decision, we did consider the particle size and particle size distribution as related properties. Specifically, we determined that Kamauchi's and Manev's disclosures would have suggested decreasing both the average particle size and the particle size distribution (Decision 15).

Regardless, the interrelatedness of the average particle size and particle size distribution is raised for the first time on appeal in this Request. In accordance with 37 C.F.R. § 41.52, because such a new argument is not made regarding a "recent relevant decision of the Board or a Federal Court" or in response to a new grounds of rejection under § 41.50(b), Appellants' newly advanced argument has not been considered.

Appellants further contend that the Board, in factual finding 15 (Decision 13), factually erred in determining that Manev's teaching to form an average particle size between 1 micron to 15 microns with 99% of the particles having a diameter of less than 40 microns could relate to forming submicron particles (Request 7). Appellants further contend that the Board factually erred in extrapolating the discussion of Manev at a distance greater than a micron into a distance scale less than a micron average particle size (Request 8).

Appellants do not contest the latter portion of our factual finding 15 which states that Manev's average particle size range of 1 to 15 microns "touches the claimed 'less than about 1000 nm' (i.e., less than about 1 μ m) range of claim 1." In other words, Appellants do not contest that claim 1 encompasses an average particle size of 1 micron as disclosed by Manev. Accordingly, Appellants' focus on the submicron scale improperly excludes that claim 1 broadly includes 1 micron or slightly larger particles.

Moreover, Appellants do not contest our factual findings 9-14 on pages 12-13 of the Decision, which find that Manev discloses that the art recognizes that average particle size and particle size distribution are important variables and that the size of the particles and the distribution should be decreased. Accordingly, Appellants have not shown error in our determination that Manev's and Kamauchi's teachings as a whole would have suggested decreasing the average particle size to the submicron level and decreasing the particle size distribution to include the range claimed by Appellants. Appellants' arguments focus on Manev's single disclosure regarding the spinel material, rather than the teachings of the references as a whole.

Appellants argue that the Board committed a legal error in shifting the burden to Appellants to establish criticality in the claimed particle size distribution range (Request 8-9). Appellants contend *In re Woodruff*, 919 F.2d 1575 (Fed. Cir. 1990) does not support the Board's position of shifting the burden to Appellants. Appellants argue that *Woodruff* concerned an almost anticipatory prior art disclosure where the prior art and claimed ranges touched, whereas in the present appeal Kamauchi does not disclose

anything about particle uniformity and Manev discloses different compositions and different average particle size ranges than claimed (Request 9).

Contrary to Appellants' argument, the facts in *Woodruff* are on point with those presented in this appeal. As in *Woodruff*, Manev's range of 1 micron to 15 microns undisputedly touches the claimed average particle size of "less than about 1000 nm." Accordingly, the only difference between the claimed invention and the prior art is the particularly claimed particle size distribution range, which is related to the average particle size (i.e., "essentially no particle greater than about 5 times the average particle size"). Accordingly, as the *Woodruff* court stated, where the difference between the prior art and the claimed invention is some range or other variable within the claims, Appellants must show that the particular range is critical. *Woodruff*, 919 F.2d at 1578.

Moreover, as the Decision at page 15 points out, prior to indicating that Appellants have the burden of showing criticality in the claimed particle size distribution range, we concluded, like the Examiner, that Manev's teachings as a whole would have suggested decreasing the particle size as taught by Kamauchi and decreasing the particle size distribution to those claimed by Appellants (i.e., that the Examiner established a prima facie case of obviousness). Therefore, the burden was properly shifted to Appellants to establish criticality in the claimed particle size distribution range, which Appellants have not done.

Appellants argue that the Board legally erred by not considering the teachings of the references as a whole or considering the predictability in the

art (Request 10). Specifically, Appellants contend that there is no reasonable expectation of success in forming the particular combination (Request 11). Appellants argue that Manev discloses that grinding is not suitable for battery materials at all for any particle size and that the particle size should not be too small (i.e., submicron) (Request 11). Appellants further contend that Kamauchi does not disclose anything regarding particle uniformity, so this silence certainly does not lead to a reasonable expectation of success (Request 12). Appellants argue that Manev does not in any way suggest that Appellants' claimed composition of matter can be formed and, therefore, cannot make up for Kamauchi's deficiencies (i.e., the particle size distribution) such that there is not a reasonable expectation of success (Request 13). We disagree.

Appellants' arguments overlook that Manev discloses that it is generally known to grind intercalation materials to form the desired particle size and particle size distribution (Manev, col. 1, ll. 34-67; col. 2, ll. 1-8). As noted on page 13 of the Decision, Manev's disclosures that grinding does not produce the desired particle sizes or particle size distributions related to spinel battery material only, not to battery materials generally (FF 14). Moreover, on page 12 of the Decision, we found that Kamauchi discloses using a ball mill to pulverize the material and form the desired particle size including a submicron particle size (FF 5-7). These disclosures indicate that there is a reasonable expectation that grinding may be used to achieve the claimed average particle size and particle size distribution. Accordingly, for the reasons given in the Decision and those above, we adhere to our determination that Manev's and Kamauchi's teachings as a whole provide a

reasonable expectation of success in using Kamauchi's grinding process to form the claimed particle size and particle size distribution.

Appellants argue, for the first time in this appeal, that U.S. Patent 5,549,880 shows that the milling process is not a predictable process (i.e., there is no reasonable expectation that using Kamauchi's milling process would have been successful) (Request 12). In accordance with 37 C.F.R. § 41.52, because such a new argument is not made regarding a "recent relevant decision of the Board or a Federal Court" or in response to a new grounds of rejection under § 41.50(b), Appellants' newly advanced argument has not been considered.

Appellants argue that Manev teaches that the average particle sizes should not be too small and limits the discussion to particles sizes greater than 1 micron (Request 13). Appellants contend that Manev's teaching that the particles size should not be too small discourages the combination of Kamauchi's teaching to have a submicron particle size (Request 14). We disagree.

As noted on pages 19-20 of the Decision, Manev's disclosure of micron sized particles regards spinel intercalation material. However, Manev includes a broader disclosure that, generally, the average particle size and particle size distribution should be decreased. The Manev disclosure is not limited to particle sizes greater than 1 micron for battery materials other than spinel. We determine that Manev's broad disclosure does not teach away from having a submicron particle size as taught by Kamauchi.

Appellants contend that the Examiner has failed to shoulder the burden of rebutting Appellants' evidence of non-enablement/inoperability

contained in the Horne Declaration (Request 16). However, Appellants' argument presumes that Appellants have shouldered their burden of explaining the data in the Horne Declaration. As we indicated on pages 20-21 of the Decision, Appellants have not satisfied their requirement to explain any proffered evidence. In this case, the Appellants have not explained their data; in particular what is the average particle size of their samples to show that the claimed average particle size and particle size distribution would not have been achieved using Kamauchi's grinding process. Appellants now contend that the average particle size is not critical to the interpretation of the result with respect to the failure of the grinding process to obtain the claimed material (Request 17). This argument is not understood.

Appellants' failure to determine the average particle size for the samples in the Horne Declaration renders the evidence insufficient to establish that Kamauchi's grinding process is incapable of producing Appellants' claimed composition having the average particle size and particle size distribution. Contrary to Appellants' argument, the average particle size of the samples is critical to analyzing the data. Specifically, Appellants' claims require that the particle size distribution be measured relative to the average particle size, such that any determination that the Horne Declaration evidence shows that Kamauchi's grinding process cannot achieve the claimed particle size distribution would require knowing the average particle size of the samples.

Appellants attempt to rectify this shortcoming of the Horne Declaration by presenting, for the first time, a calculated average particle size and particle size distribution in the Request on page 17. However,

Appellants' statement in the Request does not explain how the average particle size was calculated from the data of the Horne Declaration. Accordingly, it is unclear whether and how the Horne Declaration data evinces the newly calculated average particle size. Therefore, Appellants' attempt to rectify the Horne Declaration's shortcoming is considered to be a new argument. In accordance with 37 C.F.R. § 41.52, because such a new argument is not made regarding a "recent relevant decision of the Board or a Federal Court" or in response to a new grounds of rejection under § 41.50(b), Appellants' newly advanced argument has not been considered.

Appellants' arguments that the Delacourt and Streibel articles establish that the particle size and particle size distribution claimed provide unexpected results are without persuasive merit (Request 18). Appellants further argue that Manev suggests that going below 1 micron particle size is undesirable and Kamauchi is silent regarding particle uniformity such that the claimed particle size and particle size distribution provide unexpected results (Request 18-19).

However, as explained on pages 16-17 of the Decision, the Delacourt and Streibel articles merely state what was already disclosed by Manev and Kamauchi. Namely, that decreasing particle size and the particle size distribution provide beneficial results (i.e., improved battery cycling). Moreover, as noted above, the teachings of Manev and Kamauchi, as a whole, would have suggested the claimed particle size and particle size distribution.

For the above reasons, we adhere to our determination that claims 1-3, 6, 7, 12, 14-17, 19-21, 48-50, 52, 53, 55, 56, and 58-61 are unpatentable

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under § 103 over Kamauchi in view of Manev and claims 8, 9, and 18 are unpatentable under § 103 over Kamauchi in view of Manev and Goodenough.

The Request for Rehearing is denied.

DENIED

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